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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

VILLAGE OF STOUFFVILLE

COUNTY OF YORK

1967

VILLAGE OF STOUFFVILLE 1967
COUNTY OF YORK

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Report

on a

Water Pollution Survey

of the

VILLAGE OF STOUFFVILLE

County of York

November 1967

District Engineers Branch

Division of Sanitary Engineering

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

I INTRODUCTION

This report is concerned with the assessment of water quality within the Village of Stouffville. Surveys of this nature are made by the Ontario Water Resources Commission for the purpose of recording existing and potential sources of water pollution. When these sources are noted, recommendations concerning their abatement are made to the parties concerned.

A water pollution survey was made in this village in 1961 at which time several recommendations were made pertaining to the abatement of certain pollution sources. This report summarizes these recommendations and comments on the action taken. The remaining problems are subsequently discussed.

The appendix to the report lists the results of samples collected on June 19, 20 and August 15, 1967, from Duffin Creek and its tributaries within the municipality and any discharges thereto. An interpretation of these results is also presented.

II GENERAL INFORMATION

The village is situated on Highway 47 just east of Highway 48 and the 1966 assessed population was 3,701.

The municipal water works system consists of several wells, two storage reservoirs with a total capacity of 750,000 gallons, and chlorination facilities. The developed area of the village is entirely

serviced with municipal water. The total consumption for 1966 was 130,382,800 gallons. The bacteriological quality of the water has been generally satisfactory.

The built-up areas are essentially 100 per cent serviced with sanitary sewers. Sewage treatment is accomplished by a conventional activated sludge water pollution control plant. Surface-water drainage flows to the west branch of Duffin Creek and its tributaries within the municipality. Storm sewers are provided for surface drainage in the downtown area and in two outlying areas, while the remainder of the municipality has open ditches.

The municipal garbage disposal site is located in the Township of Uxbridge. There are no garbage disposal sites in the village.

III ACTION TAKEN ON WATER POLLUTION CONTROL

The following is a list of the recommendations made in the 1961 survey and the action which has been taken.

<u>Recommendations</u>	<u>Action Taken</u>
1. Every effort should be made to increase the treatment efficiency of the Stouffville water pollution control plant.	The capacity of the plant has been increased. The plant efficiency is discussed later in the report.
2. The managements of the local Creamery and Dairy should provide proper treatment of their industrial wastes.	The Maple Leaf Dairy has been taken over by another firm and the plant is no longer used for processing. Contaminated industrial wastes from the Stouffville Creamery are now discharged to the sanitary sewer. Cooling water is discharged to Duffin

Recommendations

Action Taken

- Creek. The appended results indicate a satisfactory quality for discharge.
3. In reference to pollution of Duffin Creek from other sources such as private drain outlets, the co-operation of the municipal officials in locating and eliminating all such sources is solicited.
- In general, municipal officials have co-operated in combating water pollution. However, no concentrated programme of locating private drain outlets has been established.

IV EXISTING WATER POLLUTION CONDITIONS

(a) Municipal Storm Sewers

Ten storm sewer outfalls were observed during both sampling periods; eight had no dry-weather flow indicating that storm water only is carried by these sewers.

The main outfalls in the downtown section discharge to both the east and west sides of the creek beneath Main Street (sampling points DF 18.8-W-1 and DF 18.8-W-2). Samples collected from the outfall on the west side on two occasions revealed satisfactory water quality. Although the water appeared to be quite clear, an excessive coliform count of 8,800,000 per 100 millilitres was noted in a sample collected from the east discharge on June 8. On August 15, there was no flow from this outlet. However, there may be a source of contamination to this discharge. This should be determined and if such a source exists, it should be eliminated.

(b) Private Outfalls

Sampling point DF 18.8-P is a 2-inch pipe draining to

Duffin Creek at Main Street. On August 15, a small flow of a yellow-coloured liquid was observed here. A bacteriological sample revealed 100,000 coliforms per 100 ml. The source of this liquid should be located and eliminated.

Two or three small outlets noted in the vicinity of the Main Street bridge did not have any flow at the time of observation.

(c) Water Pollution Control Plant

This is a 450,000 GPD conventional activated sludge plant consisting of an old and a new section. The original plant was built in 1956 and the extension was completed in 1962. Sludge digestion, seasonal effluent chlorination and sand filtration are provided.

The following effluent quality and treatment efficiency has been achieved for the past 3 years.

Year	<u>Raw Sewage</u>		<u>Final Effluent</u>	
	Average BOD (ppm)	Average Suspended Solids (ppm)	Average BOD (ppm)	Average Suspended Solids (ppm)
1964	180	224	25.3	12
1965	150	198	13.9	11.9
1966	152	219	21.5	19.0

Year	<u>Treatment Efficiency</u>	
	BOD % Reduction	Suspended Solids % Reduction
1964	86.5	95.0
1965	91.0	94.0
1966	86	91

The samples submitted over the years have indicated that the plant is capable of producing a very good effluent. However, there

have been operational difficulties and the hydraulic load exceeds the plant capacity some 40 to 50 per cent of the time.

A proposed extension of the sewer system to serve two new subdivisions to be developed in the municipality has prompted the preparation of a report on a further extension to the plant; also, recommendations on improvements in the general operation of the plant are to be made. The Water Quality Surveys Branch of the Commission has completed a study pertaining to organic loadings which may be placed on the creek. This information will be considered in the plant extension programme.

(d) Industrial

Water pollution from industrial sources is not of major concern in Stouffville. In the past the Stouffville Machine and Tool Company dumped wastes consisting of oil coated aluminum trimmings and scrap metal near the creek; this is now being collected in bulk containers and hauled away.

During the previous survey, it had been reported that wastes of an oily nature were draining to the Duffin Creek tributary from Stouffville Auto Wreckers storage yard. The area was investigated on two occasions during this survey and the condition was not apparent.

At the Stouffville Arena, cooling water from the compressors and the ammonia tanks in the refrigeration room is discharged to the Duffin Creek tributary. No flows were noted here during this survey.

(e) General Discussion

Although there are no apparent major water pollution sources in the village, the coliform counts on surface-water samples were generally in excess of the Commission objectives. Considerable use of the area upstream from the village is made for pasture-land, and the relatively high counts obtained in the upstream samples indicate a degree of agricultural pollution. This is also near the headwaters of the creek and even slightly contaminated storm sewer or other discharges could create excessive coliform counts during low flows in the summer.

Low BOD and solids contents were revealed in the samples of the water pollution control plant effluent. The high coliform count in the effluent sample taken on August 15 is reflected downstream by the excessive count obtained at this point.

Throughout the village, a considerable amount of refuse can be noted in the creek bed. Although this is not having an adverse effect on water quality, it should be removed from an esthetic point of view.

Commendable work has been done to combat water pollution in the village by the elimination of the industrial waste problems and the efforts to keep the capacity of the water pollution control plant in line with the growth of the municipality. The same efforts should be expended to eliminate the existing minor problems and to ensure a continuing programme of water pollution control.

V SUMMARY

This report is concerned with the assessment of water quality in the Village of Stouffville.

The results of the chemical samples collected from Duffin Creek and its tributaries were generally satisfactory, but the bacteriological samples revealed fairly high coliform counts. Various reasons for this are discussed in the report.

Considerable action has been taken since the previous water pollution survey to eliminate water pollution in the village. The present plan to extend the water pollution control facilities is an example of this continuing action.

Excessive bacteriological counts were noted in samples collected from the storm sewer outfall on the east side of Main Street, and a private outfall at the Main Street bridge.

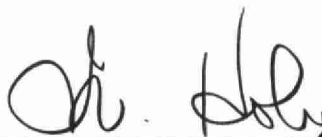
VI RECOMMENDATIONS

(1) The water pollution control plant extension programme should be continued.

(2) The sources of contamination to the storm sewer and the private outfall at Main Street should be located and eliminated.

(3) The refuse which is lying in the Duffin Creek bed at various locations should be removed.

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SIGNIFICANCE OF LABORATORY ANALYSES

Bacteriological Examination

The membrane filter technique is employed to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres. The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. A membrane filter coliform count in excess of the desirable upper limit of 2,400 organisms is considered to render waters undesirable for bathing purposes.

The M.P.N. Index reported by Regional Health Laboratories on drinking water supplies as the "Most Probable Number" (M.P.N.) per 100 millilitres of sample is employed to determine the count of coliform bacteria present in water supplies.

Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (ppm), and is an indication of the amount of oxygen required for the stabilization of decomposable organic matter in the water. The completion of the laboratory test requires five days, under the controlled incubation temperature of 20⁰ Centigrade.

The Commission objective for surface-water quality is an upper limit of four (4) ppm.

Solids

The value for total solids, expressed in parts per million (ppm), is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally the most significant of the solids analyses in regard to surface-water quality.

The effects of suspended solids in water are reflected in difficulties associated with water purification, depositions in streams and injury to the habitat of fish.

VILLAGE OF STOUFFVILLE

RESULTS OF SAMPLES COLLECTED

TABLE 1

SAMPLING POINT No.	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS			M.F. COLIFORM COUNT PER 100 ML	ESTIMATED FLOW	REMARKS
				TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)			
DF 18.5	DUFFIN CREEK DOWNSTREAM FROM WPCP.	JUNE 20/67	2.9	270	9	261	50		
		AUG. 15/67	3.2	418	5	413	5,400		
DF 18.6-T	WPCP SOUTH OUTFALL.	JUNE 20/67	6.7	580	9	571	48		
		AUG. 15/67							NO FLOW
DF 18.6-I	DUFFIN CREEK UPSTREAM FROM SOUTH OUTFALL.	JUNE 20/67	1.2	304	4	300	11,700		
		AUG. 15/67	3.6	478	5	473	6,300		
DFS 18.6-R	RELIEF OUTFALL WPCP.	JUNE 20/67							NO FLOW
		AUG. 15/67							NO FLOW
DF 18.62-T	WPCP NORTH OUTFALL.	JUNE 20/67							NO FLOW
		AUG. 15/67	3.9	556	5	551	6,900		
DF 18.7	DUFFIN CREEK AT SOMERVILLE STREET.	JUNE 19/67	3.8	300	8	292	25,700		CONSIDERABLE
		AUG. 15/67	1.1	298	7	291	10,900		AMOUNT OF REFUSE IN CREEK.
DF 18.7-I	INDUSTRIAL OUTFALL TO EAST BANK.	JUNE 20/67	2.6	308	4	304	12	7-GPM	CLEAR
		AUG. 15/67	2.9	322	8	314	24	3-GPM	CLEAR
DF 18.7-W	15-INCH CORRUGATED METAL OUTFALL TO WEST BANK.	JUNE 15/67							NO FLOW
		AUG. 15/67							NO FLOW
DF 18.7-P	4-INCH TILE DRAIN TO EAST BANK.	JUNE 19/67	1.7	286	1	285	152		
		AUG. 15/67							MINIMUM FLOW
DF 18.74-W	8-INCH CORRUGATED METAL OUTFALL TO EAST BANK.	JUNE 20/67							NO FLOW
		AUG. 15/67							NO FLOW

TABLE 1 (CONTD)

SAMPLING POINT No.	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS			M.F. COLIFORM COUNT PER 100 ML	ESTIMATED FLOW	REMARKS
				TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)			
DF 18.75-W	8-INCH CAST IRON OUTFALL TO EAST BANK.	JUNE 20/67 AUG. 15/67							NO FLOW NO FLOW
DF 18.75-W (E)	12-INCH CORRUGATED METAL OUTFALL AT MARKET STREET (EAST SIDE).	AUG. 15/67							NO FLOW
DF 18.76-W (W)	12-INCH CORRUGATED METAL OUTFALL AT MARKET STREET (WEST SIDE).	AUG. 15/67							NO FLOW
DF 18.8	DUFFIN CREEK AT MAIN STREET.	JUNE 19/67 AUG. 15/67	3.0 1.1	310 298	3 9	307 289	9,200 3,000		
DF 18.8-W-1	24-INCH CONCRETE OUT- FALL TO CREEK UNDER MAIN STREET (WEST SIDE)	JUNE 19/67 AUG. 15/67	3.2 1.1	960 712	1 4	959 708	824 700	10-GPM 5-GPM	CLEAR CLEAR
DF 18.8-W-2	15-INCH TILE OUTFALL TO CREEK UNDER MAIN STREET (EAST SIDE).	JUNE 19/67 AUG. 15/67	8.0	292	3	289	8,800,000	5-GPM	CLEAR NO FLOW
DF 18.8-P	2-INCH STEEL PIPE UNDER- NEATH BOBS BARBER SHOP.	JUNE 20/67 AUG. 15/67					100,000		NO FLOW MINIMAL FLOW YELLOW-COLOURED LIQUID.
DF 18.95-W	CULVERT COLLECTING DITCHES ON EDWARD STREET, RUPERT AVENUE ETC.	JUNE 20/67 AUG. 15/67							NO FLOW NO FLOW
DF 19.2	DUFFIN CREEK UPSTREAM FROM STOUFFVILLE.	JUNE 19/67 AUG. 15/67	3.6 1.4	300 284	8 8	292 276	3,500 4,600		UPSTREAM CONST. BEING CARRIED OUT.

TABLE 1 (CONTD)

SAMPLING POINT No.	DESCRIPTION	DATE	5-DAY BOD (PPM)	SOLIDS			M.F. COLIFORM COUNT PER 100 ML	ESTIMATED FLOW	REMARKS
				TOTAL (PPM)	SUSP. (PPM)	DISS. (PPM)			
DFS 18.7	DUFFIN CREEK TRIBUTARY DOWNSTREAM FROM STOUFFVILLE ARENA.	JUNE 20/67	1.7	342	74	268	11,000		MINIMUM STREAM FLOW
		AUG. 15/67	1.6	358	1	357	6,000		MINIMAL FLOW
DFS 18.7-P	OUTFALL FROM STOUFFVILLE ARENA - COOLING WATER.	JUNE 20/67							No FLOW
		AUG. 15/67							No FLOW
DFS 18.8-W-1	OUTFALL TO TRIBUTARY AT MAIN STREET - WEST SIDE.	JUNE 20/67							No FLOW
		AUG. 15/67							No FLOW
DFS 18.8-W-2	OUTFALL TO TRIBUTARY AT MAIN STREET - EAST SIDE.	JUNE 20/67							No FLOW
		AUG. 15/67							No FLOW
DFS 19.04	DUFFIN CREEK TRIBUTARY AT MANITOBA STREET.	AUG. 15/67	1.6	372	3	369	5,600		
DFST 19.05	DITCH WHICH DRAINS TO TRIBUTARY AT MAIN STREET.	JUNE 20/67	1.2	572	4	568	5,000		MINIMAL FLOW CLEAR
		AUG. 15/67	2.7	476	2	474	4,200		
ST-1-W	36-INCH CONCRETE OUTFALL AT NINTH CONCESSION.	JUNE 20/67							No FLOW
		AUG. 15/67							No FLOW
ST-2-W	OUTFALL TO DITCH AT 10TH CONCESSION.	AUG. 15/67							No FLOW

LEGEND

- ST-1 S STOUFFVILLE OUTFALLS
- DF-18-5 STREAM SAMPLING POINT SHOWING MILEAGE
- DF-18-6 OUTFALL SHOWING STREAM AND MILEAGE
- TYPE OF OUTFALL
- I - INDUSTRIAL WASTE EFFLUENT
- P - PRIVATE SEWER
- R - RELIEF SEWER FROM A PUMPING STATION
- S - SANITARY SEWER
- T - TREATMENT PLANT EFFLUENT
- W - STORM SEWER

